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DESIR, PIERRE LOUIS	
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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

Office Action Summary	Application No.	Applicant(s)	
	10/731,760	CHOTKOWSKI ET AL.	
	Examiner	Art Unit	
	Pierre-Louis Desir	2617	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _13 January 2006_.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-36_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-36_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _09 December 2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: _____.

DETAILED ACTION

1. The Art Unit location of your application in the USPTO has changed. To aid in correlating any papers for this application, all further correspondence regarding this application should be directed to Art Unit 2617.

Response to Arguments

2. Applicant's arguments filed 01/13/2006 have been fully considered but they are not persuasive.

Applicant argues that Etkin is not related to adjusting the alignment of beams emanating from two communicating entities. Applicant also argues that Etkin does not anticipate claim 33 because it does not disclose a method of coordinating beam forming between communicating entities. As a final not, adds applicant, the method disclosed in Etkin is time-invariant.

Examiner respectfully disagrees with Applicant. Etkin teaches a method wherein base station 12 is configured to perform time-varying beam forming operations through the use of one or more antenna arrays in conjunction with an FPM scheme or a similar scheme. "Beam forming" is used herein to refer to the forming of a directional antenna gain pattern for the forward link of a base station. In one embodiment, an antenna array consisting of two antenna elements is utilized. Each antenna itself has a fixed, possibly directional, but relatively broad gain pattern. A first one of these antennas transmits a signal with a constant amplitude gain and phase, while the other of the antennas transmits the same signal, but at a possibly lower amplitude gain and with a time-varying phase shift relative to the first antenna. The two signals interfere with each other, constructively in some regions and destructively in others, resulting in a modified time-varying antenna gain pattern, which is possibly narrower and more directional

than either of the two individual antenna gain pattern (see page 4, paragraph 47). Therefore, the rejection stands.

Applicant further argues that Etkin fails to disclose a scheme of measuring an error in alignment of two beams emanating from two communicating entities, determining a correction factor based on the measured error, and readjusting the beams to realign the two beams. Applicant also argues that Raleigh only teaches a method having a calibration factor for the transmit and receive signals of a single unit.

Examiner respectfully disagrees with Applicant. As related to "determining a correction factor", this specific language is not present in the claim. And, Applicant is hereby reminded that the claim was rejected in view of Etkin and Guo in further view of Raleigh. Etkin discloses a method wherein a base station is configured to perform time-varying beamforming operations through the use of one or more antenna arrays. In paragraph 49, Etkin also discloses that as the base station transmits signals (**beamformed** or otherwise), each of the mobile station within the sector receives the signal and computes a SINR. Thus, control information regarding the use of beam forming is not communicated between the entities if the signals transmitted by the base station are beamformed signals (see fig. 1, page 4, paragraph 47), the method comprises at least one adjustment parameter for a first of the two communicating entities (i.e. beam width) (see abstract, and page 2, paragraph 21), selecting at least one adjustment parameter for a second of the two communicating entities (i.e., power gain) (see page 2, paragraph 22). Guo discloses a method comprising measuring an error in the alignment of beams emanating from the two communicating entities and adjusting the beam of the two communicating entities in an amount equal to the measured error such that the two beams emanating from the two communicating

entities are aligned with respect to each other (i.e., the output signal y(t) of the beam former 50 is compared with a reference signal d(t) using a subtraction element 44, and the resulting difference signal e(t), representing the difference between the actual output signal of the beam former and the reference signal, is applied to the tracking unit 52 which uses that error signal to adjust the weights applied to the multipliers) (see col. 11, lines 61-67). Raleigh discloses a method for coordinating the use of beam forming between two communicating entities (see abstract), **the transmit and the receive sections of the particular transceiver employed are calibrated. The calibration procedure and apparatus described herein corrects for differences wherein in the amplitude and phase match between the signal paths through the transceiver corresponding to <u>each antenna element of the frequency channels</u>.** This matching correction allows receive channel statistics collected for each of the frequency channel to be accurately used within the corresponding transmit channel (see col. 21, lines 32-48). Thus, one skilled in the art would unhesitatingly conceptualize a correction factor for the communication entities must first be inherently determined before the beam of the communication entities can be calibrated or adjusted.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 33-36 are rejected under 35 U.S.C. 102(e) as being anticipated by Etkin et al. (Etkin), Pub. No US2004/0204108.

Regarding claim 33, Etkin discloses a method for coordinating the use of beam forming between two communicating entities, the method comprising the step of: reducing at least one adjustment parameter of a beam of at least one of two communicating entities communicating with each other using beamed formed transmission and reception signals wherein a degree of alignment between beams emanating from the two entities is above a predetermined level for a predetermined length of time (i.e., the base station will be able to provide good coverage to the whole sector. If the number of mobile stations is greater than or equal to N.sub.1, but less than a higher threshold N.sub.2, the fluctuation rate (denoted by "R") and the beam width (denoted by "W") are set to some pre-selected medium values, R.sub.1 and W.sub.1, respectively. Exemplary values for R.sub.1 may be 1 to 4 cycles per second. Exemplary values for W.sub.1 may be 45 to 60 degrees. If the number of mobile stations is greater than or equal to a higher threshold N.sub.2, the beam width is set to a small value W.sub.2, and the fluctuation rate is set to a high value R.sub.2. If N.sub.2 is set to a very large value, the base station will either turn off the FPM scheme (if the number of mobile stations is less than N.sub.1), or otherwise use some fixed values for the fluctuation rate and the beam width) (see fig. 1, page 4, paragraphs 44 and 47).

Regarding claim 34, Etkin discloses a method as described in claim 33 rejection, wherein the at least one adjustment parameter that is reduced is beam width (see page 3, paragraph 22).

Regarding claim 35, Etkin discloses a method as described in claim 33 rejection, wherein the at least one adjustment parameter that is reduced is power gain (see page 3, paragraph 22).

Regarding claim 36, Etkin discloses a method as described in claim 33 rejection, wherein the at least one adjustment parameter that is reduced is beam width and power gain (see page 3, paragraph 22).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 1-5, 23-28, and 29-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Etkin et al. (Etkin), Pub. No US2004/0204108 in view of Guo et al. (Guo), U.S. Patent No. 6894643.

Regarding claim 1, Etkin discloses a method for coordinating the use of beam forming between two communicating entities (see fig.1, page 4, paragraph 46) wherein control information regarding the use of beam forming is not communicated between the two entities (i.e., base station is configured to perform time-varying beamforming operations through the use of one or more antenna arrays. In paragraph 49, Etkin also discloses that as the base station transmits signals (**beamformed** or otherwise), each of the mobile station within the sector receives the signal and computes a SINR. Thus, control information regarding the use of beam forming is not communicated between the entities if the signals transmitted by the base station are beamformed signals) (see fig. 1, page 4, paragraph 47), the method comprising the steps of: selecting one of the two communicating entities for reduction of the amount in which the

selected entity will adjust its beam in response to misalignment between beams emanating from the two entities (i.e. the base station is configured to perform beam forming operations through the use of one or more antenna arrays) (see fig. 1,page 4, paragraph 47); selecting at least one adjustment parameter for adjusting the beam of the selected entity (i.e. beam width) (see abstract, and page 2, paragraph 21); and adjusting the beam of the selected entity using the selected adjustment parameter (see page 4, paragraphs 44 and 47).

Although Etkin discloses a method as described, Etkin does not specifically disclose a method comprising the steps of measuring an error in the alignment of the beams emanating from the two communicating entities; adjusting the beam of the selected entity using the selected adjustment parameter in accordance with the measured error, whereby the beams emanating from the two communicating entities are aligned with respect to each other.

However, Guo discloses a method comprising the steps of measuring an error in the alignment of the beams which are being emanated and adjusting the beam in accordance with the measured error (i.e., the output signal y(t) of the beam former 50 is compared with a reference signal d(t) using a subtraction element 44, and the resulting difference signal e(t), representing the difference between the actual output signal of the beam former and the reference signal, is applied to the tracking unit 52 which uses that error signal to adjust the weights applied to the multipliers) (see col. 11, lines 61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation for doing so would have been to provide features related to good estimate of the optimum control

information, which can be obtained from the relative phase delays between signals received by respective elements (col. 3, lines 8-12).

Regarding claim 2, Etkin discloses a method as described in claim 1 rejection, wherein the two communicating entities are a base station and a WTRU (see fig. 1, page 4, paragraph 46).

Regarding claim 3, Etkin discloses a method as described in claim 1 rejection, wherein the two communicating entities are two WTRUs (see fig. 1, page 4, paragraph 46).

Regarding claim 4, Etkin discloses a method as described in claim 1 rejection, wherein the at least one adjustment parameter is selected from the group consisting of boresight orientation, beam width, and power gain (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 5, Etkin discloses a method as described above (see claim 1 rejection).

Although Etkin discloses a method comprising the step of: repeating the adjusting step until the error measured is below a predetermined value (see page 2, paragraph 15, and page 5, paragraph 49), Etkin does not specifically disclose a method comprising the step of repeating the measuring step.

However, Guo discloses a method comprising repeating the step of measuring (i.e., error signal is used to adjust the W1-W4 applied to the multipliers 62 (1) to 62 (4)).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation for doing so would have been to provide features related to good estimate of the optimum control information, which can be obtained from the relative phase delays between signals received by respective elements (col. 3, lines 8-12).

Regarding claim 23, Etkin discloses a wireless communication system wherein beams may be adjusted to enhance wireless communications between wireless entities operating in the system (see fig.1, page 4, paragraph 46), the wireless communication system comprising: a plurality of wireless entities (see abstract), said entities being capable of communicating using beam formed transmission and reception patterns (see abstract and figs. 1-2, page 4, paragraphs, 46-47, page 5, paragraph 49); and wherein at least one of two communicating wireless entities selects at least one adjustment parameter for adjusting its beam (see abstract, and page 2, paragraphs 14 and 21, page 4, paragraph 44).

Although Etkin discloses a system comprising a software application which may be embodied in a data processor, and may be configured to identify the number of mobile stations in the sector, determine whether beamforming is to be performed and the corresponding rate of rotation, generate control signals to provide the desired beamforming, if necessary (paragraph 77), Etkin does not specifically disclose a system comprising a processor for measuring an error in the alignment of their own beam and the beam of another entity with which they are communicating, and wherein the selection of at lest one adjustment parameter for adjusting its beam a fraction of the error measured in the alignment of its beam with respect to the beam of the other wireless entity.

However, Guo discloses a system wherein the output signal y(t) of the beam former 50 is compared with a reference signal d(t) using a subtraction element 44, and the resulting difference signal e(t), representing the difference between the actual output signal of the beam former and the reference signal, is applied to the tracking unit 52 which uses that error signal to adjust the weights applied to the multipliers (see col. 11, lines 61-67). Guo further discloses a processor

programmed to perform the steps of: (i) performing an iterative adaption algorithm to produce iterative control information for adjusting the receiver beam pattern so as to facilitate reception of the transmission signal; (ii) producing an estimate of desired control information by combining the received signals with a replica of the predetermined data so as substantially to remove the effect of data modulation due to the predetermined data from the received signals; and (iii) selecting as the control information input to the beam former either the iterative control information, or the estimate of the desired control information (see col. 7, lines 53-65).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation for doing so would have been to provide features related to good estimate of the optimum control information, which can be obtained from the relative phase delays between signals received by respective elements (col. 3, lines 8-12).

Regarding claim 24, Etkin discloses a wireless communication system as described in claim 23 rejection, wherein the processor of the at least one communicating wireless entity is configured to adjust the beam of the at least one wireless entity in an amount equal to the fraction multiplied by an error measured (i.e., a processor configured to determine whether beamforming is to be performed and the corresponding rate of rotation, generate control signals to provide the desired beamforming) (see paragraph 77).

Regarding claim 25, Etkin discloses a wireless communication system as described in claim 23 rejection, wherein the processor of the at least one communicating wireless entity is configured to select at least one adjustment parameter for performing said adjustment (see, and page 4, paragraphs 44, 47, and 77).

Regarding claim 26, Etkin discloses a wireless communication system as described in claim 25 rejection, wherein the at least one adjustment parameter is selected from the group consisting of boresight orientation, beam width, and power gain (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 27, Etkin discloses a wireless communication system configured to maintain alignment of its beam with the beam of another wireless entity with which the WTRU is communicating (see fig. 1, paragraph 46).

Although Etkin discloses a system wherein a processor is configured to select on adjustment parameter for adjusting the beam (see paragraph 77), Etkin does not specifically disclose a system wherein the WTRU comprising: a first processor configured to measure an error in the alignment of a first beam emanating from the WTRU and a second beam emanating from the other wireless entity; and a second processor configured to compute a first fraction and adjust the first beam using the at least one selected parameter in an amount equal to the first fraction multiplied by the error measured.

However, Guo discloses a system comprising a processor programmed to perform the steps of: (i) performing an iterative adaption algorithm to produce iterative control information for adjusting the receiver beam pattern so as to facilitate reception of the transmission signal; (ii) producing an estimate of desired control information by combining the received signals with a replica of the predetermined data so as substantially to remove the effect of data modulation due to the predetermined data from the received signals; and (iii) selecting as the control information input to the beam former either the iterative control information, or the estimate of the desired control information (see col. 7, lines 53-65). It should also be noted that the beam

former may be implemented in hardware, or as a software module running on the same or a different processor (col. 8, lines 43-45). And, through the processor, the output signal y(t) of the beam former 50 is compared with a reference signal d(t) using a subtraction element 44, and the resulting difference signal e(t), representing the difference between the actual output signal of the beam former and the reference signal, is applied to the tracking unit 52 which uses that error signal to adjust the weights applied to the multipliers (see col. 11, lines 61-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both arts to arrive at the claimed invention. A motivation for doing so would have been to provide features related to good estimate of the optimum control information, which can be obtained from the relative phase delays between signals received by respective elements (col. 3, lines 8-12).

Regarding claim 28, Etkin discloses a WTRU as described in claim 27 rejection, further comprising: a transmitter configured to transmit the fraction of the measured error that the WTRU will adjust its beam to the wireless entity with which the WTRU is communicating (see page 5, paragraph 49).

Regarding claim 29, Etkin discloses a WTRU, as disclosed in claim 28 rejection, further comprising: a receiver configured to receive, from the wireless entity with which the WTRU is communicating, a second fraction with which the entity used to adjusts its beam (i.e. the base station transmits signals, each of the mobile stations within the sector receives the signal and computes a SINR (see page 3, paragraph 22, and page 5, paragraph 49).

Although Etkin discloses a WTRU as described above, Etkin fails to specifically disclose when a second fraction is received, the second processor being configured to compute the first

fraction by subtracting one minus the second fraction and adjusting the first beam in an amount equal to the first fraction multiplied by the error measured.

Guo discloses a system wherein when a second fraction is received, the second processor being configured to compute the first fraction by subtracting one minus the second fraction and adjusting the first beam in an amount equal to the first fraction multiplied by the error measured (see col. 11, lines 61-67).

Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both teaching to arrive at the claimed invention. A motivation to do so would have been to arrive at an accurate adaptive transmit beam forming based on the result of an adaptive receive beam forming as related to the error measurement.

Regarding claim 30, The WTRU of claim 29 wherein the wireless entity with which the WTRU is communicating is another WTRU (see fig. 1, page 4, paragraph 46).

Regarding claim 31, WTRU of claim 29 wherein the wireless entity with which the WTRU is communicating is a base station (see fig. 1, page 4, paragraph 46).

Regarding claim 32, Etkin discloses a WTRU as described in claim 27, wherein the at least one adjustment parameter is selected from the group consisting of boresight orientation, beam width, and power gain (see page 2, paragraph 14, and page 3, paragraph 22).

7. Claims 6-11, 19-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Etkin and Guo in further view of Raleigh et al. (Raleigh), U.S. Patent No. 6665545.

Regarding claim 6, Etkin discloses a method for coordinating the use of beam forming between two communicating entities (see fig.1, page 4, paragraph 46) wherein control

information regarding the use of beam forming is communicated between the two entities ((i.e., base station is configured to perform time-varying beamforming operations through the use of one or more antenna arrays. In paragraph 49, Etkin also discloses that as the base station transmits signals (**beamformed** or otherwise), each of the mobile station within the sector receives the signal and computes a SINR. Thus, control information regarding the use of beam forming is not communicated between the entities if the signals transmitted by the base station are beamformed signals) (see fig. 1, page 4, paragraph 47), the method comprising the steps of: selecting at least one adjustment parameter for a first of the two communicating entities (i.e. beam width) (see abstract, and page 2, paragraph 21); selecting at least one adjustment parameter for a second of the two communicating entities (i.e., power gain) (see page 2, paragraph 22).

Guo discloses a method comprising the step of measuring an error in the alignment of beams emanating from the two communicating entities and adjusting the beam of the two communicating entities in an amount equal to the measured error such that the two beams emanating from the two communicating entities are aligned with respect to each other (i.e., the output signal y(t) of the beam former 50 is compared with a reference signal d(t) using a subtraction element 44, and the resulting difference signal e(t), representing the difference between the actual output signal of the beam former and the reference signal, is applied to the tracking unit 52 which uses that error signal to adjust the weights applied to the multipliers) (see col. 11, lines 61-67).

Although Etkin discloses a method as described above, the combination does not specifically disclose a method comprising the steps of identifying a first correction factor for the first entity; identifying a second correction factor for the second entity.

However, Raleigh discloses a method for coordinating the use of beam forming between two communicating entities (see abstract), the transmit and the receive sections of the particular transceiver employed are calibrated. The calibration procedure and apparatus described herein corrects for differences wherein in the amplitude and phase match between the signal paths through the transceiver corresponding to each antenna element of the frequency channels. This matching correction allows receive channel statistics collected for each of the frequency channel to be accurately used within the corresponding transmit channel (see col. 21, lines 32-48). Thus, one skilled in the art would unhesitatingly conceptualize a correction factor for the communication entities must first be inherently determined before the beam of the communication entities can be calibrated or adjusted.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both teachings to arrive at the claimed invention. A motivation to do so would have been to have an accurate adaptive transmit beam forming based on the result of an adaptive receive beam forming.

Regarding claim 7, Etkin discloses a method as described in claim 6 rejection, wherein the two communicating entities are a base station and a WTRU see fig. 1, page 4, paragraph 46).

Regarding claim 8, Etkin discloses a method as described in claim 6 rejection, wherein the two communicating entities are two WTRUs (see fig. 1, page 4, paragraph 46).

Regarding claim 9, the combination (Etkin and Guo) discloses a method as described above (see claim 6 rejection). Etkin also discloses a method in which if the number of mobile stations is less then N.sub.1, the beam forming is turned off (see page 7, paragraph 72). One skilled in the art would immediately conceptualize that the beam-forming turning off is the result of an error measurement being insignificant.

Although the combination discloses a method as described above, the combination does not specifically disclose a method wherein the correction factor of one entity is zero thereby causing said entity to refrain from adjusting its beam.

However, Raleigh discloses a method where matching correction allows receive channel statistics collected for each of the frequency channel to be accurately used within the corresponding transmit channel (see col. 21, lines 32-48).

Therefore, it would have been obvious to one of ordinary skilled in the art to combine the teachings of Etkin, as described, with the teachings of Raleigh to arrive at a method as described in the claimed invention. A motivation to do so would have been to arrive at an accurate adaptive transmit beam forming based on the result of an adaptive receive beam forming as related to the error measurement.

Regarding claim 10, Etkin discloses a method as described in claim 6 rejection, wherein the at least one adjustment parameter for the first entity is selected from the group consisting of boresight orientation, beam width, and power gain (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 11, Etkin discloses a method as described in claim 6 rejection, wherein the at least one adjustment parameter for the second entity is selected from the group consisting

of boresight orientation, beam width, and power gain (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 19, Etkin discloses a method for coordinating the use of beam forming between two communicating entities wherein control information regarding the use of beam forming is communicated between the two entities (see Etkin fig.1, page 4, paragraph 46), the method comprising the steps of: selecting at least one adjustment parameter for each of the entities (see abstract, and page 2, paragraph 21).

Guo discloses a method comprising the step of measuring, at each entity, an error in the alignment of beams emanating from the communicating entities and adjusting the beams using adjustment parameters respective to the measured error (i.e., the output signal y(t) of the beam former 50 is compared with a reference signal d(t) using a subtraction element 44, and the resulting difference signal e(t), representing the difference between the actual output signal of the beam former and the reference signal, is applied to the tracking unit 52 which uses that error signal to adjust the weights applied to the multipliers) (see col. 11, lines 61-67).

Although the combination discloses a method as described, the combination does not specifically disclose a method comprising the step of selecting a correction factor.

However, Raleigh discloses a method for coordinating the use of beam forming between two communicating entities (see abstract), transmit and receive sections of the particular transceiver employed are calibrated. The calibration procedure and apparatus described herein corrects for differences wherein in the amplitude and phase match between the signal paths through the transceiver corresponding to each antenna element of the frequency channels. This matching correction allows receive channel statistics collected for each of the frequency

channel to be accurately used within the corresponding transmit channel (see col. 21, lines 32-48).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine both teachings to arrive at the claimed invention. A motivation to do so would have been to have an accurate adaptive transmit beam forming based on the result of an adaptive receive beam forming.

Regarding claim 20, Etkin discloses a method wherein the at least one adjustment parameter is selected from the group consisting of boresight orientation, beam width, and power gain (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 21, Etkin discloses a method wherein the at least one adjustment parameter is a plurality of adjustment parameters (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 22, Etkin discloses a method wherein the plurality of adjustment parameters are selected from the group consisting of boresight orientation, beam width, and power gain (see page 2, paragraph 14, and page 3, paragraph 22).

8. Claims 12-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Etkin, Guo, and Raleigh in view of Kingsley et al. (Kingsley), U.S. Patent No. 6768454.

Regarding claim 12, the combination discloses (Etkin, Guo and Raleigh) a method for coordinating the use of beam forming between two communicating entities (see Etkin fig.1, page 4, paragraph 46), the method comprising the steps of: selecting a first correction factor and a first adjustment parameter for each of the entities (refer to claim 6 rejection reasoning as related to

Raleigh); selecting a second correction factor and a second adjustment parameter for each of the entities (refer to claim 6 reasoning as related to Raleigh); measuring an error in the alignment of beams emanating from the two communicating entities (see Guo col. 11, lines 61-67); adjusting the beam of both entities using the two first adjustment parameters according to both entities' respective first correction factors (Refer to claim 6 reasoning); and adjusting the beam of both entities using the two second adjustment parameters according to their respective second correction factors (refer to claim 6 reasoning). The combination further discloses the transmit and the receive sections of the particular transceiver employed are calibrated, wherein a matching correction allows receive channel statistics collected for each of the frequency channel to be accurately used within the corresponding transmit channel (see Raleigh col. 21, lines 32-48). Thus, one skilled in the art would unhesitatingly conceptualize a correction factor for the communication entities must first be inherently determined before the beam of the communication entities can be calibrated or adjusted. In addition, one skilled in the art would immediately envision with calibration procedure, and matching correction process, the sum of the correction factors as related to the receiver, transmitter must be equal to one.

Although the combination discloses a method as described above, the combination fails to specifically discloses the selection for the first and second correction factor, and the first and second adjustment parameter, the measurement of an error in the alignment of beams, and the adjustment of the beam as related to the use and functionality associated with both the azimuth and the elevation dimensions.

However, Kingsley discloses a method in which the elements of the array may be arranged in a substantially linear formation, and may be arranged side by side so as to provide

azimuth beam steering or one on top of the other so as to provide elevation as well as azimuth beam steering (see col. 3, lines 55-59).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to combine the teachings of Etkin and Raleigh with Kingsley's to arrive at the claimed invention. A motivation for doing so would have been to form an array having maximum or at least improved element gain for a given array factor direction (col. 3, lines 50-54).

Regarding claim 13, Etkin discloses a method as related to claim 12 rejection, wherein the two first adjustment parameters are selected from the group consisting of boresight orientation, beam width, and power gain (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 14, Etkin discloses a method as described in claim 13, wherein the two first adjustment parameters are the same for both entities (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 15, Etkin discloses a method as described in claim 13 rejection, wherein the two first adjustment parameters are different for both entities (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 16, Etkin discloses a method as described to claim 12 rejection, wherein the two second adjustment parameters are selected from the group consisting of boresight orientation, beam width, and power gain (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 17, Etkin discloses a method as described to claim 16 rejection, wherein the two second adjustment parameters are the same for both entities (see page 2, paragraph 14, and page 3, paragraph 22).

Regarding claim 18, Etkin discloses a method as described in claim 16 rejection, wherein the two second adjustment parameters are different for both entities (see page 2, paragraph 14, and page 3, paragraph 22).

Conclusion

9. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Pierre-Louis Desir whose telephone number is (571) 272-779. The examiner can normally be reached on Monday-Friday 8:00AM- 5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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03/30/2006

JOSEPH FEILD
SUPERVISORY PATENT EXAMINER